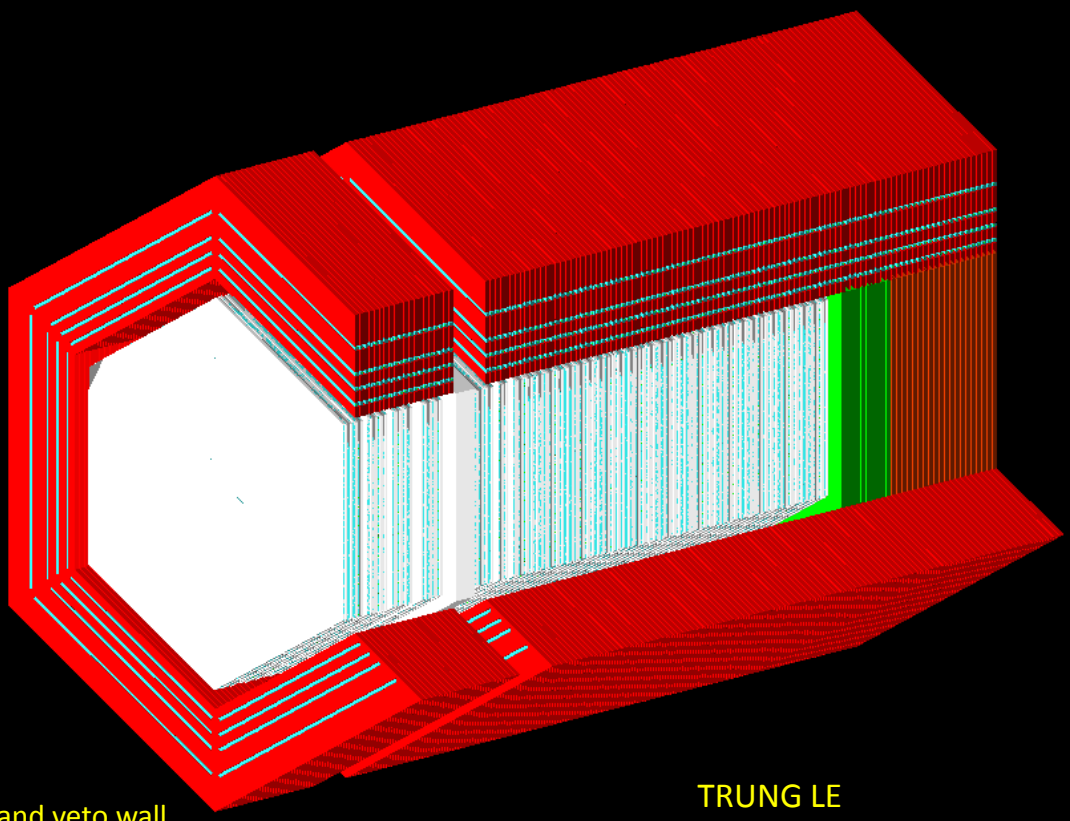
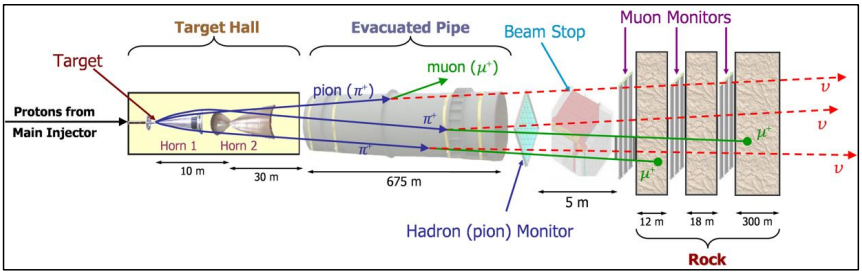
MINERvA detector simulation

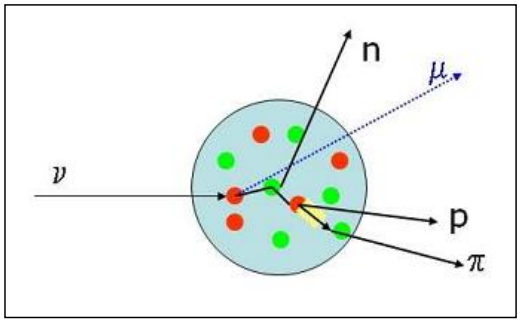


Cryo-target and veto wall
not shown

TRUNG LE

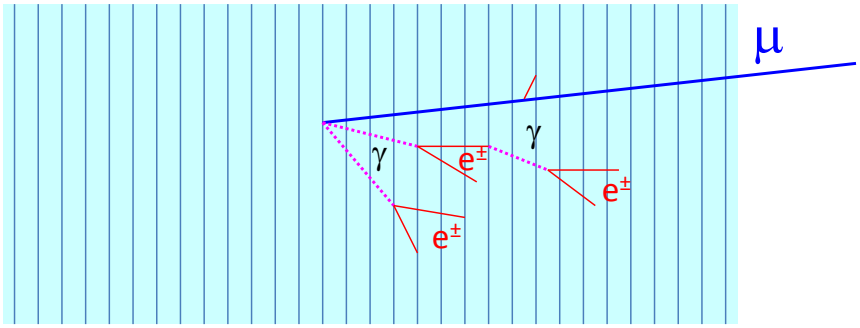
Rutgers, State University of New Jersey





g4numi

GENIE



G4 detector simulation

Detector response systematic uncertainty

- At the first step, we would like to modify G4 cross sections within their known uncertainties, e.g., neutron inelastic cross section, re-run the simulation, then redo the analysis using the cross section shifted sample
- Currently we can do this for hadronic inelastic processes by wrapping the G4 process of interest inside a discrete process and override the GetMeanFreePath() member function
- We want to implement this for other processes that may have large uncertainties in the cross sections, final-state interactions
- I guess other experiments might want to do the same to evaluate detector response systematics (in addition to test beam data). Help from G4 experts at the lab would be invaluable